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# Mel Price Locks & Dam Miter Gate Inspections

Navigation Lock and Dam Inspection and Emergency Repairs Workshop 18 - 20 April 2006

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Navigation Lock and Dam

# Inspection

and Emergency Repairs Workshop 18 - 20 April 2006

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# 3 October 2004 – Auxiliary Lock Downstream Miter Gate

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# Auxiliary Lock Downstream Miter Gate

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# Leafs Forced Downstream From Normal Mitered Position

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# Initial Inspection

- Determine scope of damage
- Gather “forensic evidence”

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# Overall Distortion – Approximately 2 Feet

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# Local Damage – Miter Ends

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# Damage to Gate Anchorages

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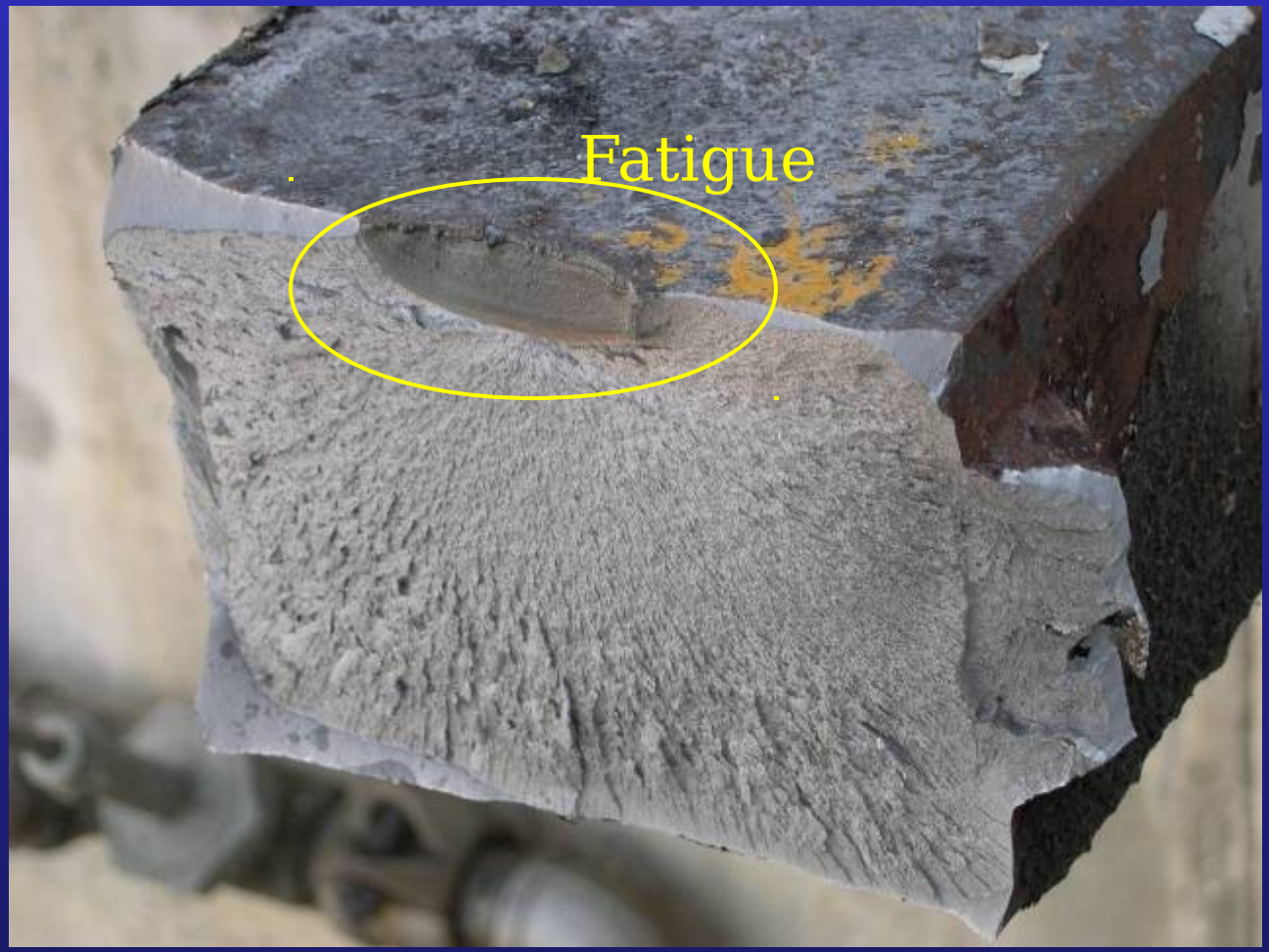
# Primary Anchorage

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# Secondary Anchorage

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# Miter Block – IL Leaf

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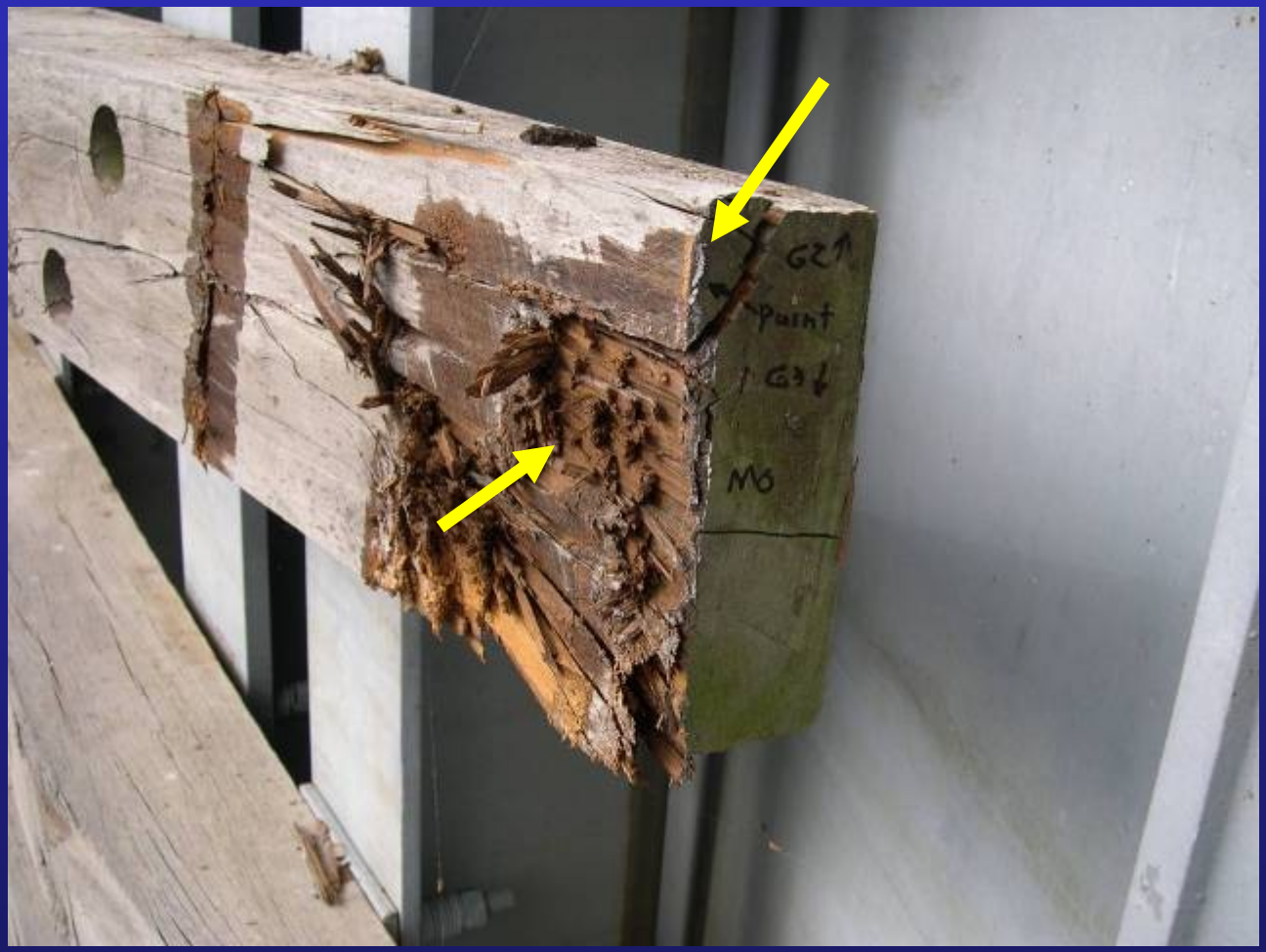
# Timber Fender – MO Leaf



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# Miter Block – IL Leaf

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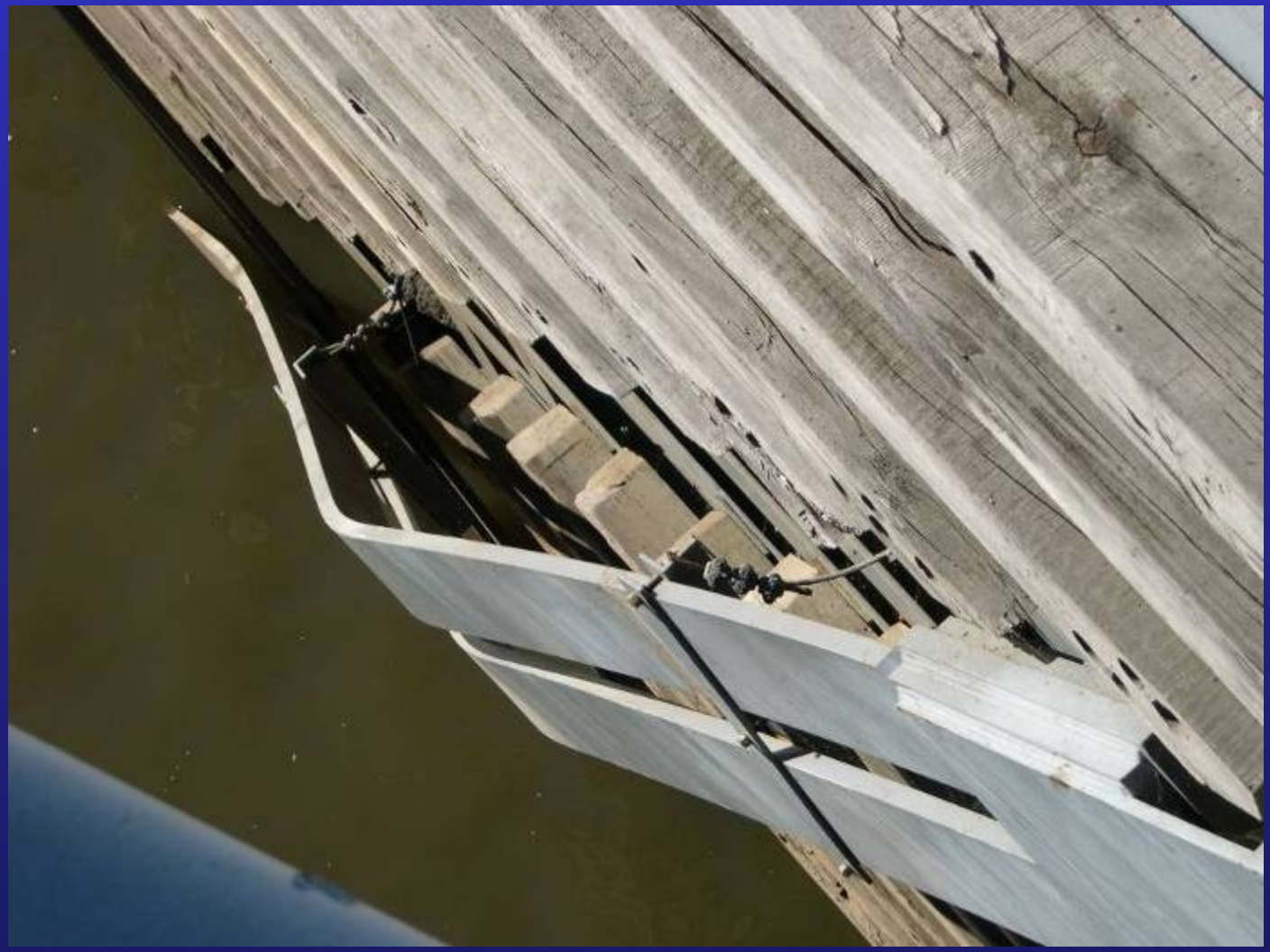
# Diagonal Failure - Buckled



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# Cracked Gusset – IL Leaf

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# Cracked Gusset – MO Leaf

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# Failed Operating Struts

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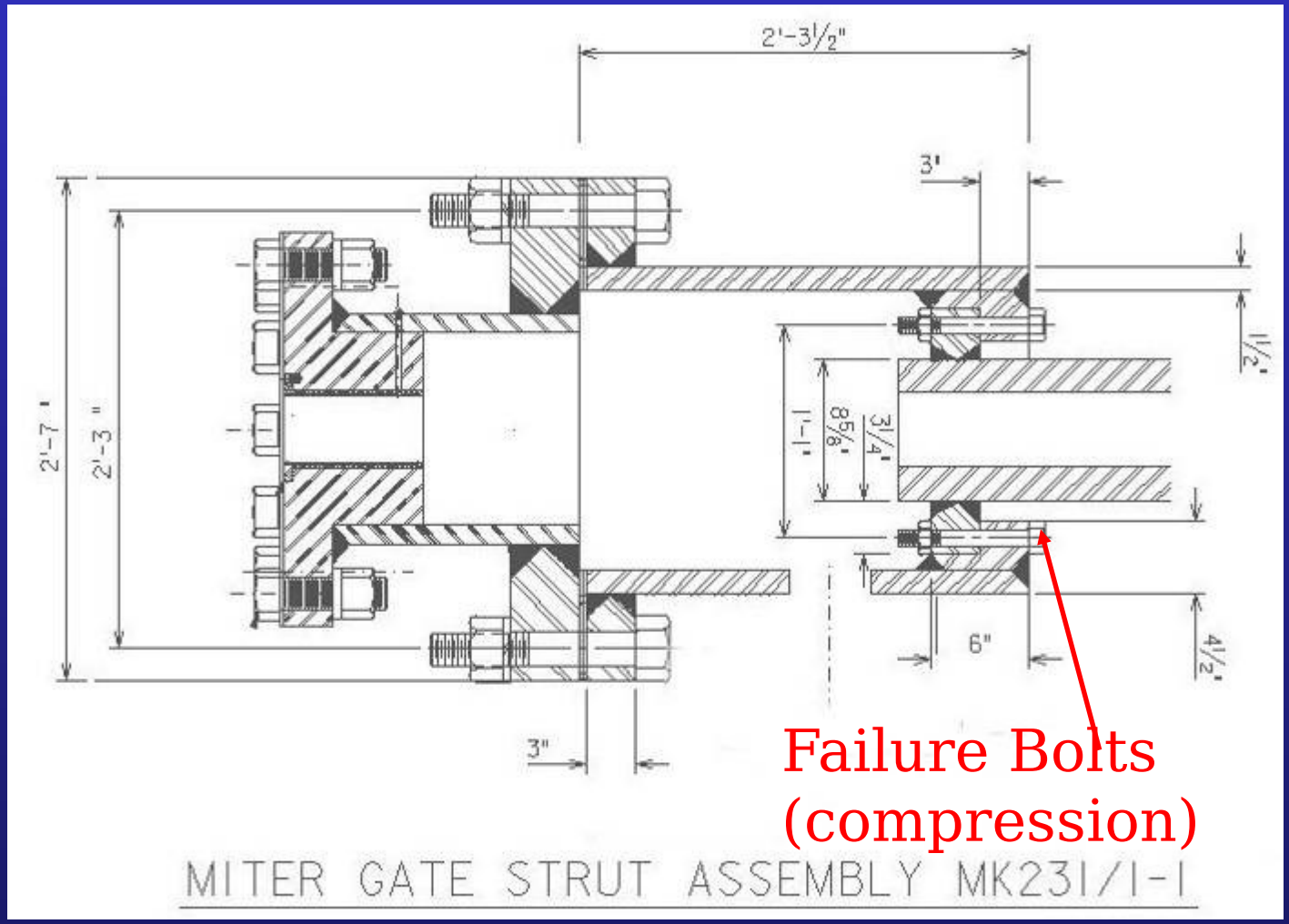
# Operating Arm Failure Tube



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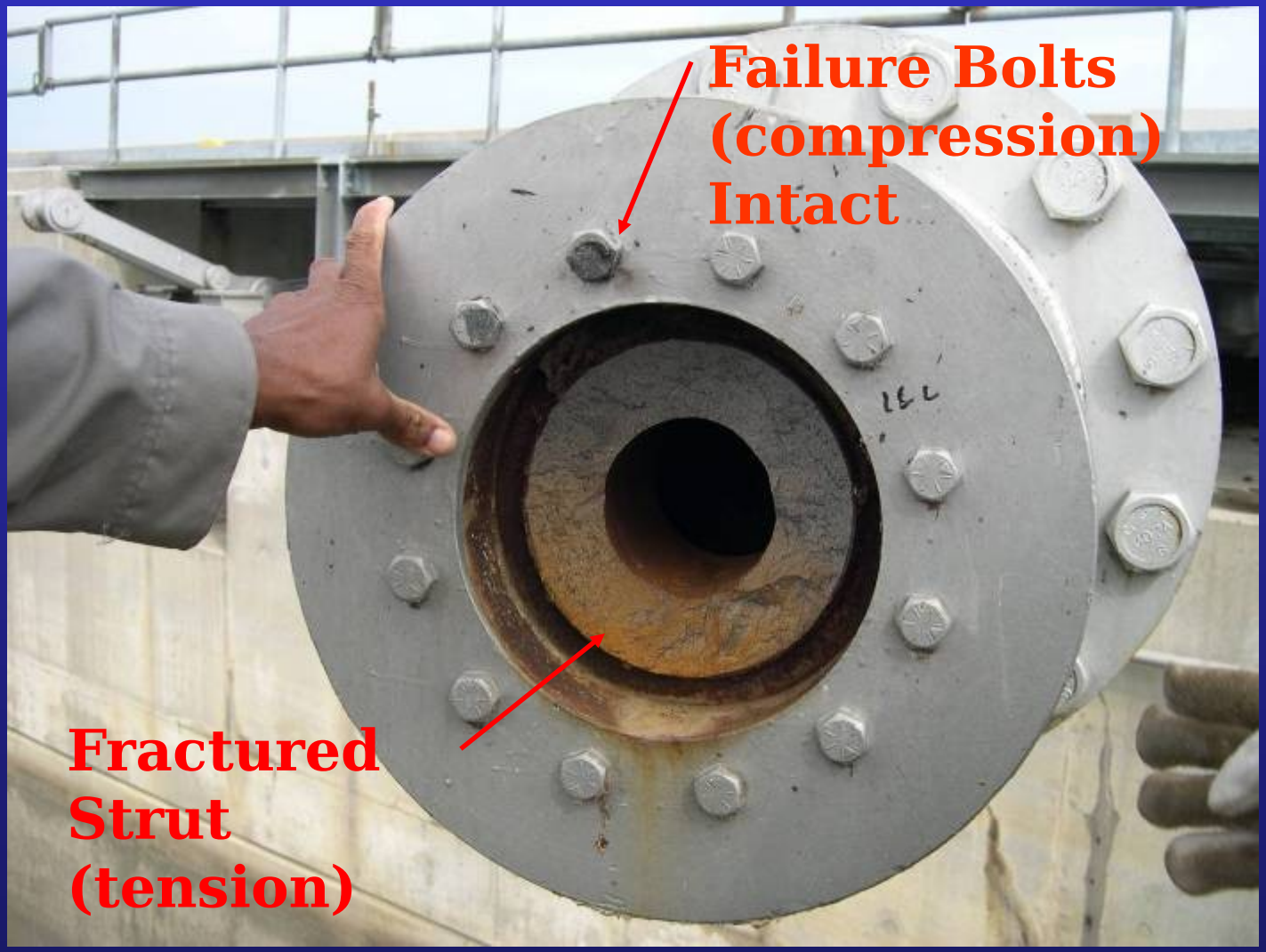
# Operating Strut Failure – IL Leaf



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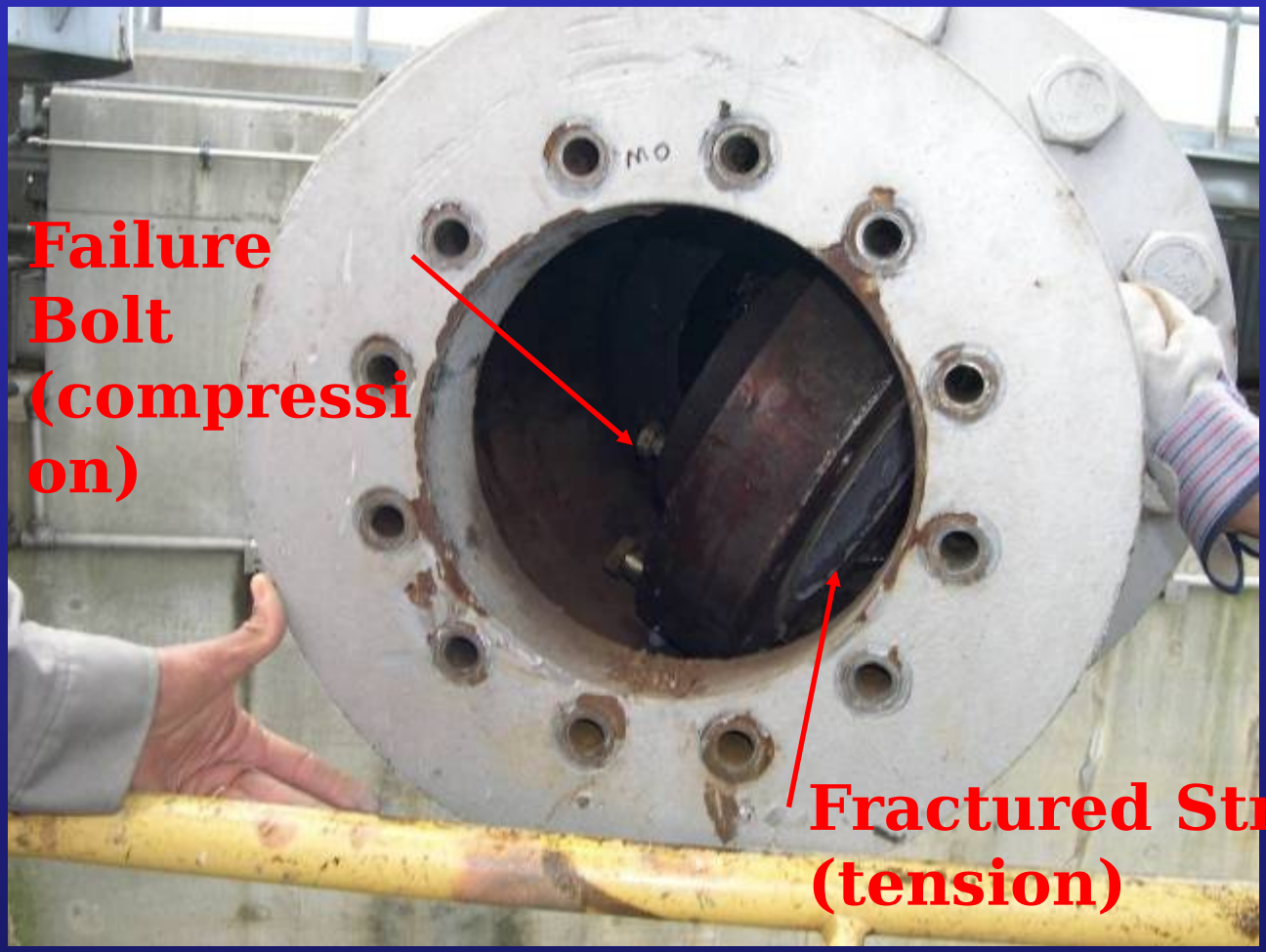
# Operating Strut Failure – MO Leaf



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# Failed Operating Strut

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# Impact Marks

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# Impact Marks

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# Gouged Operating Strut

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# Failure Tube Bolts

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# Inspection of Leafs On Gate Barge

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# Surveying Leaf

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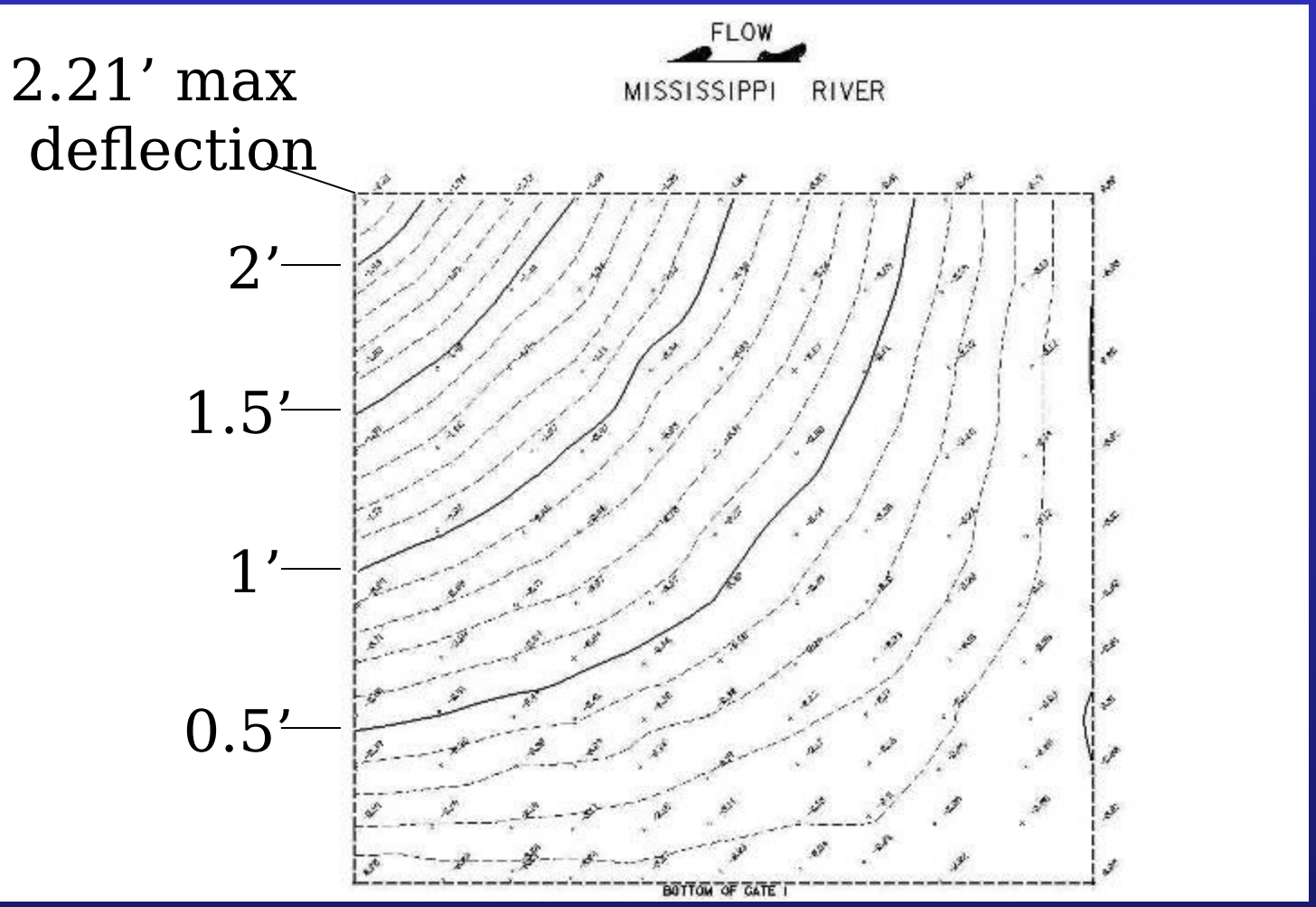
# Survey Results – Illinois Leaf



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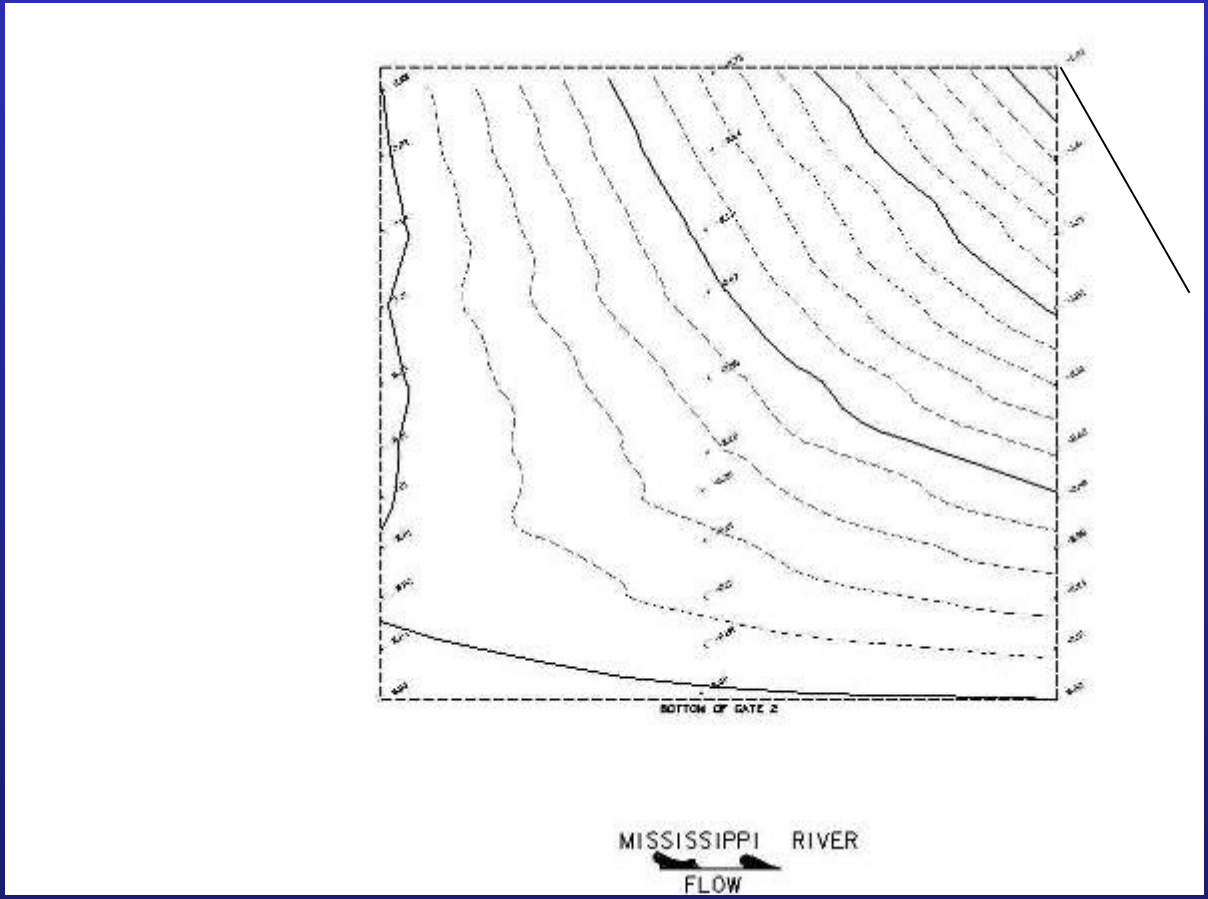
# Survey Results – Missouri Leaf




1.6’ max deflection

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# Manlift for Inspection

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# Inspection From Manlift

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# Deformed Diaphragms

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# Inspections - Leafs Horizontal

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# Leafs In Horizontal Position

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# Crack at Diaphragm Flanges

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# Crack in Girder Flanges

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# Torch Cut Hole in Girder Flange

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# Inspection of Repairs

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# UT Inspection of Diagonal Gusset

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# UT Inspection of Diagonal Gusset

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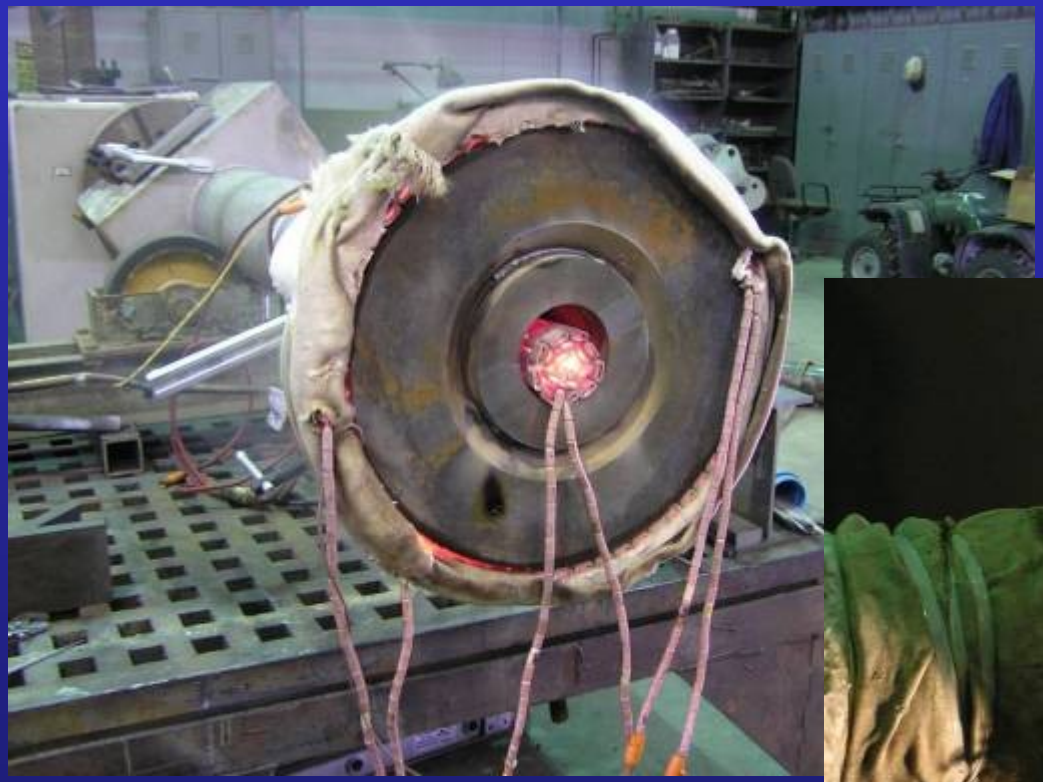
# Welding Strut Arm at Service Base



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# MT Inspection of Strut Arm at Shop

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# UT Inspection of Strut Arms

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# UT Inspection of Strut Arms

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# UT Testing Of Repaired Cracks

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# Diagonal Modification

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# Lower Diagonal Gusset

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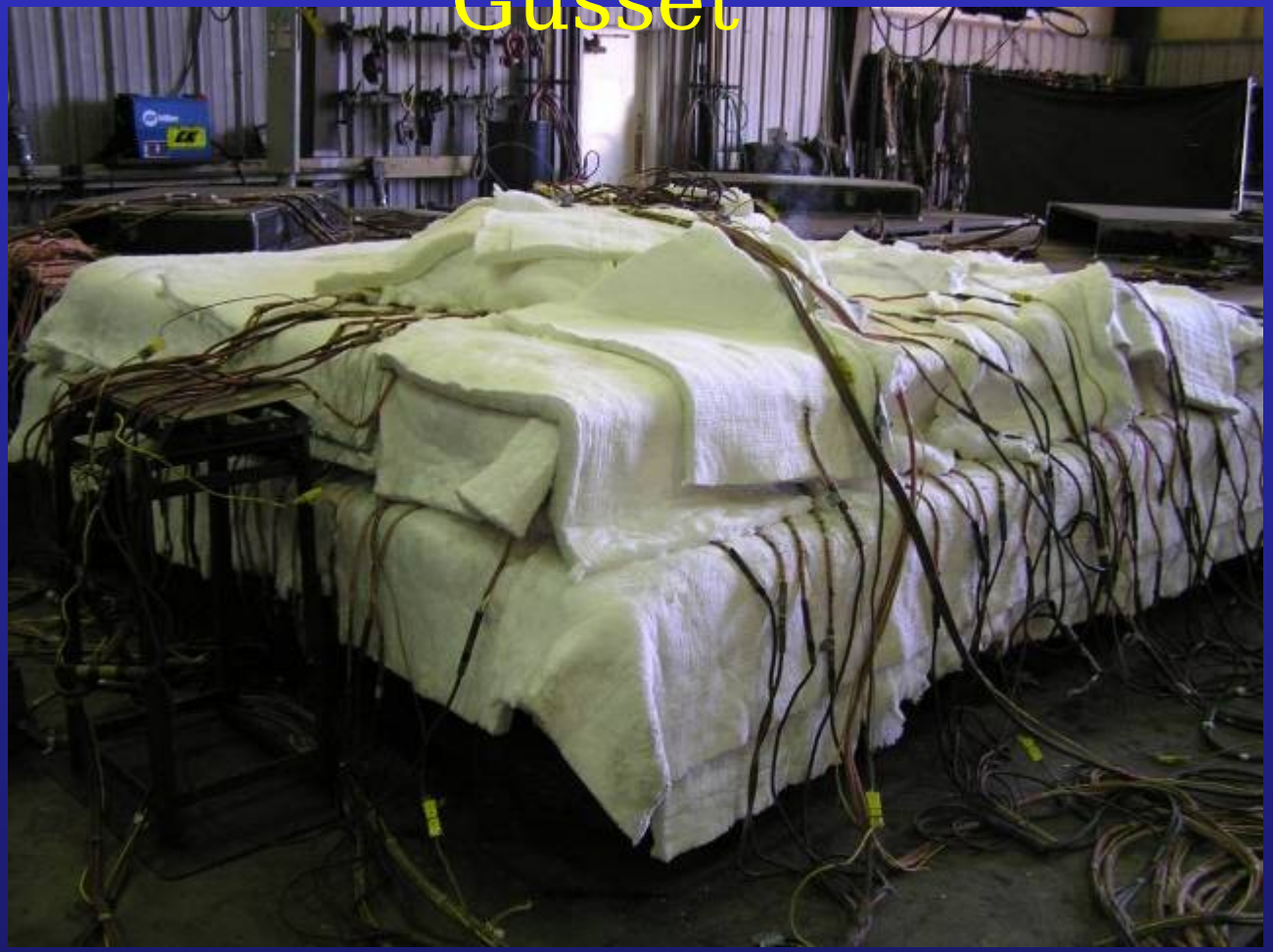
# Stress Relieving Diagonal Gusset



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# Top End of Diagonal

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# Bottom End of Diagonal

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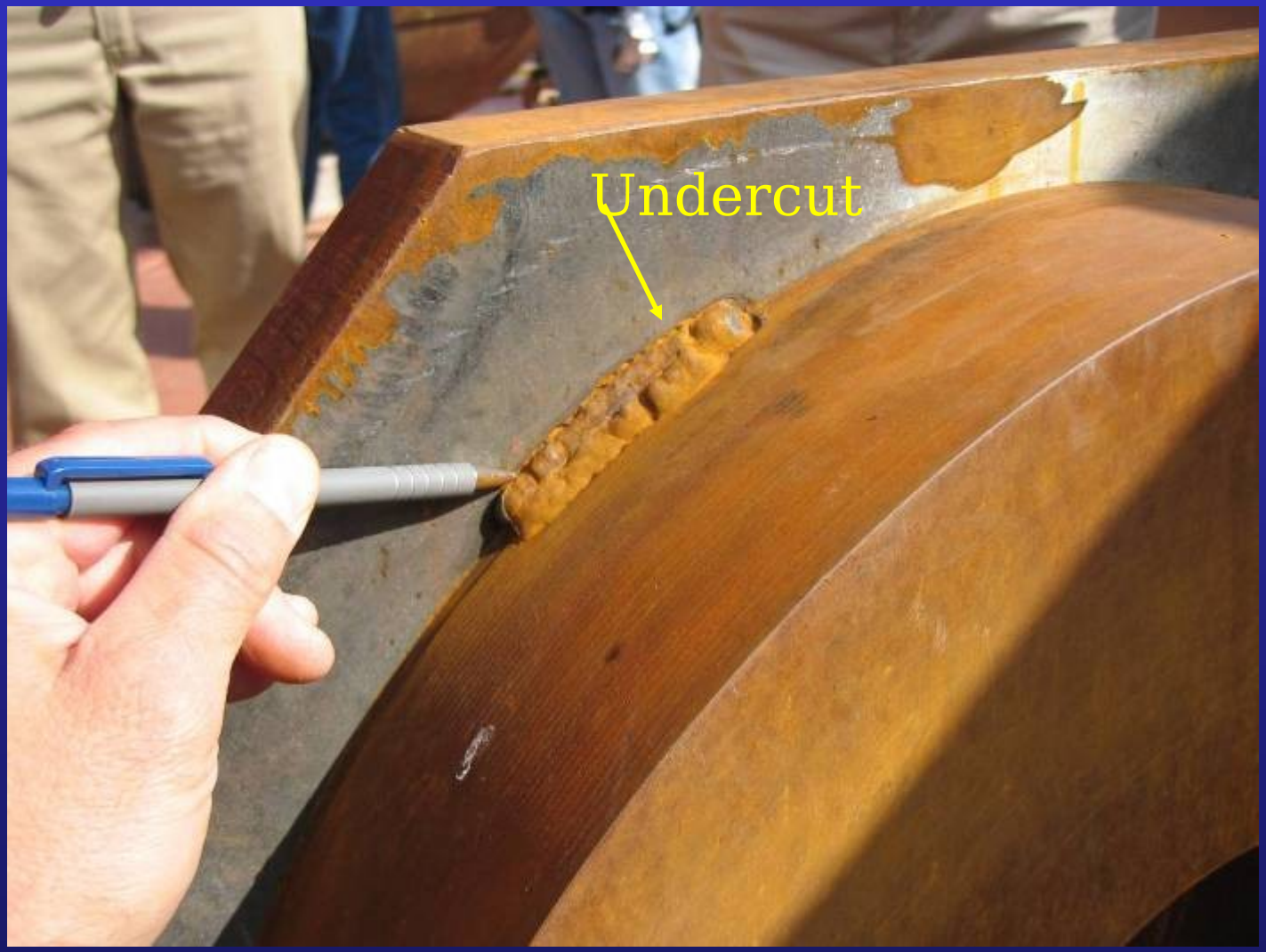
# Bottom End of Diagonal



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# Gudgeon Hood Casting

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# Casting Weld Repair Defect

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# Mel Price Lock and Dam Miter Gate Inspections

*Stay Tuned……*

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# Inspections - Other Projects

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# Locks 27 - Miter Gate Inspections and Instrumentation

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# Locks 27 – Auxiliary Lock Miter Gate

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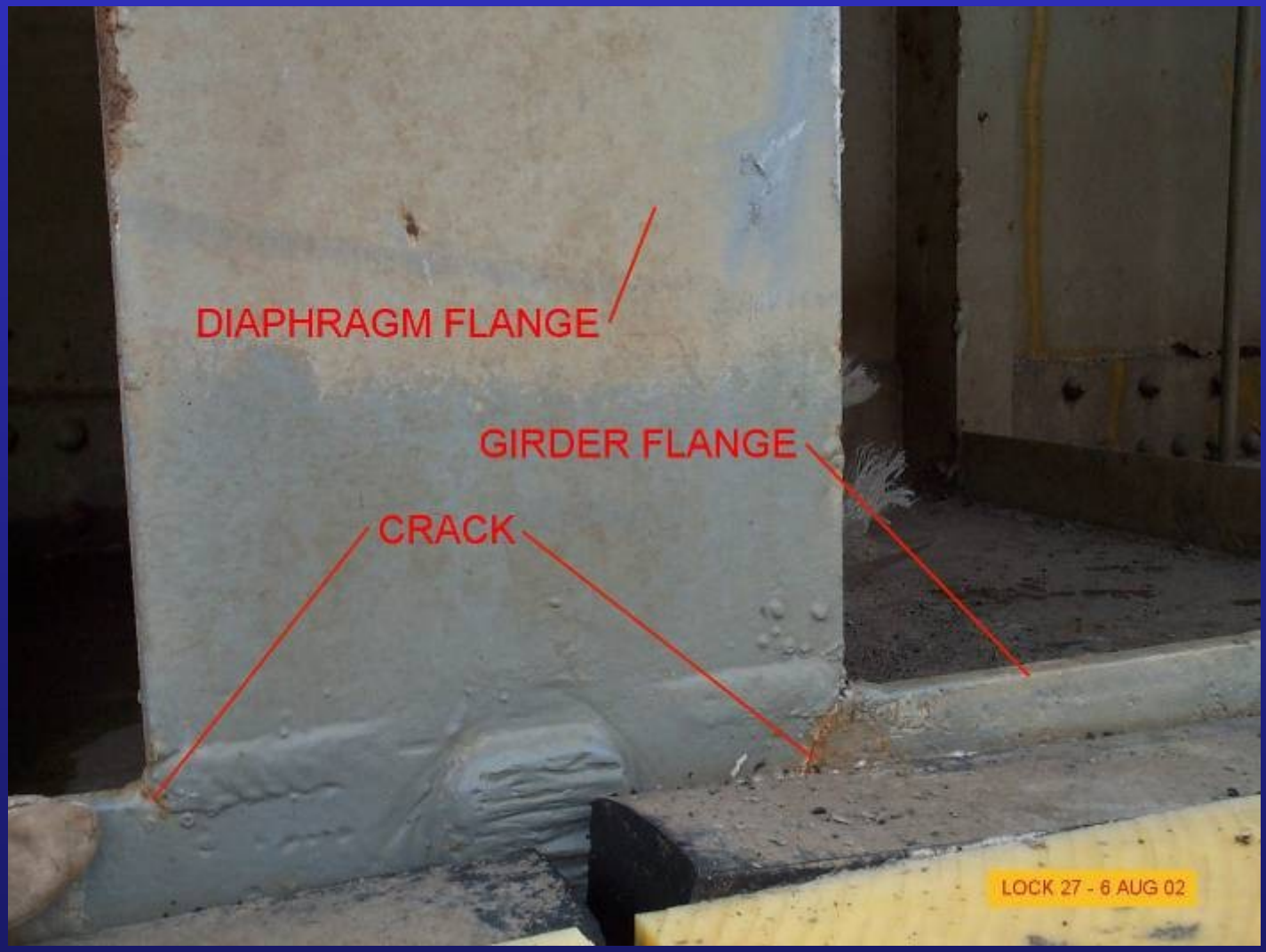
# Cracks in Girder Flanges



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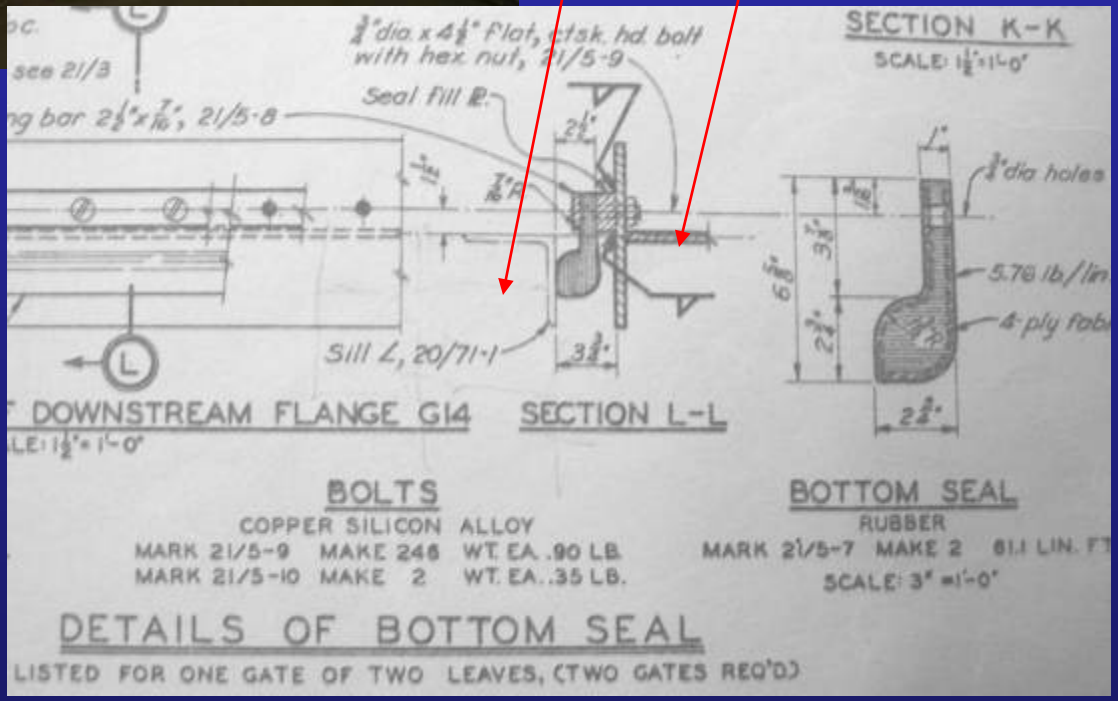
Vertical Diaphragms

Sill

Bottom Girder

**Designed as horizontally framed**



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# Instrumentation of Typical Connection

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Diaphragm Flange

Strain Transducer

Girder Flange

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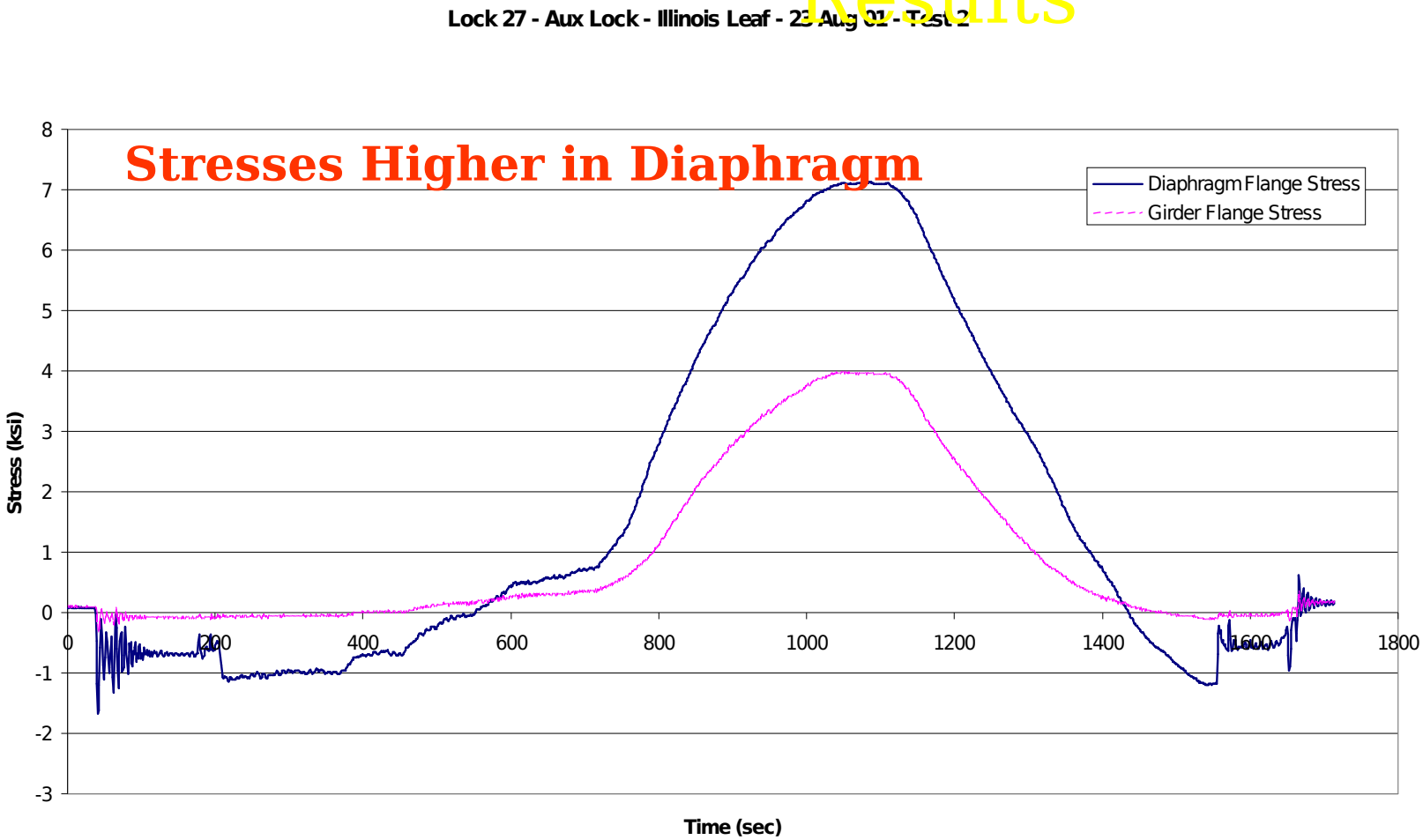
# Instrumentation Results

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# Lock 27 Miter Gate Instrumentation Results

Diaphragm

- Flange 8 ksi T
- Web 4 ksi T

Girder

- Flange 7 ksi T
- Web 3 ksi C

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# Locks 27 - Main Lock – Jan 2003

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# Locks 27 - Main Lock – Jan 2003
## Failed Diagonal Rods

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Why are rods failing?
1) Cyclic loading (beach marks = fatigue)
2) Bending (Unidirectional - beach marks on one side)

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# Instrumentation of Diagonals

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# Instrumentation on Diagonals

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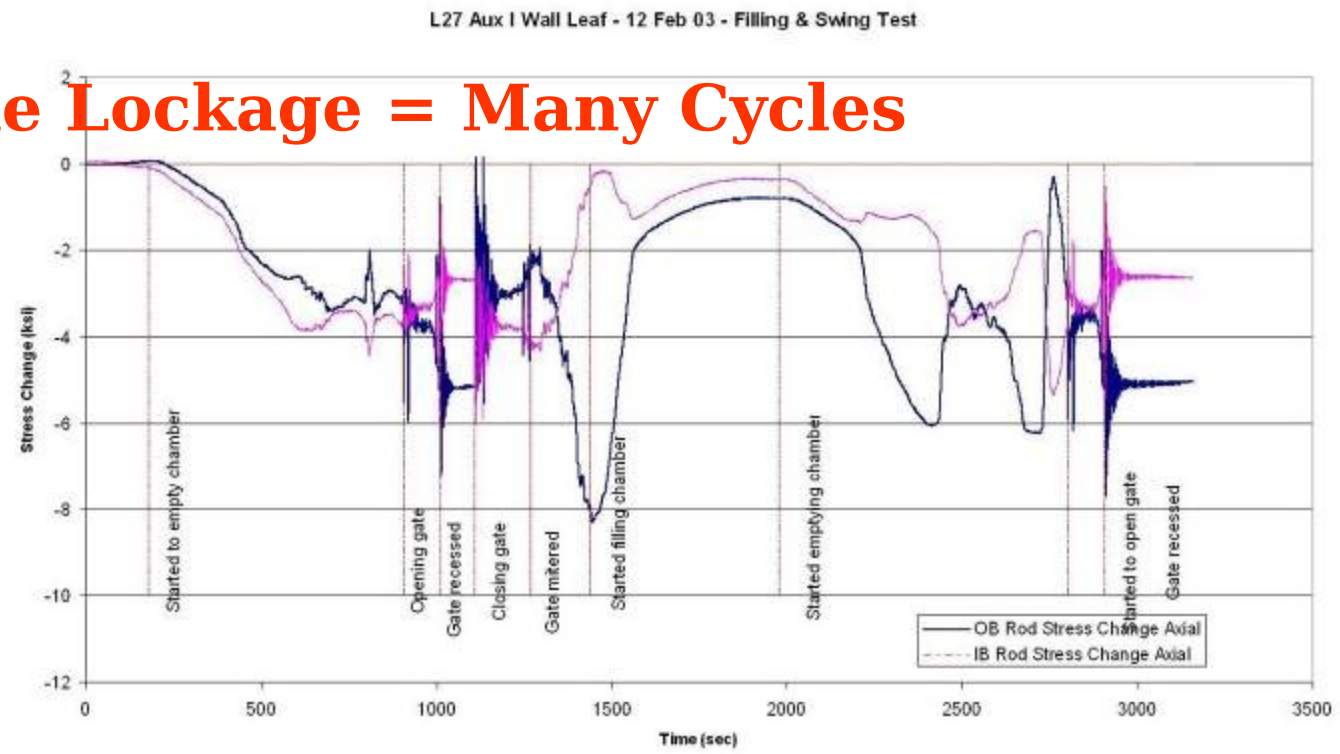
# Instrumentation Results

**One Lockage = Many Cycles**



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# Rope Access Inspections

- Tainter gates at flood control projects
- Tainter gates at navigation project
- Dam bulkheads
- Miter gates

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# Clarence Cannon Dam

## Spillway and Tainter Gates

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# Locks 27 Miter Gate

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# Kaskaskia L&D Tainter Gate

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# Carlyle Dam Tainter Gate

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Questions?

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